AMSAT News Service Weekly Bulletins
Issue: ANS-062
Date: 1990-03-03
Sources: amsat-ans-1990-ans-055.01.txt

SB ALL @ AMSAT $ANS-062.01
SA AMSAT BACAR ATV MISSION

HR AMSAT NEWS SERVICE BULLETIN 062.01 FROM AMSAT HQ
SILVER SPRING, MD MARCH 3, 1990
TO ALL RADIO AMATEURS BT

SA AMSAT Balloon Experiment To Carry Amateur TV Camera

SA AMSAT's BACAR (BAlloon Carrying Amateur Radio) mission 90/1 scheduled for March 10 will carry a black and white closed circuit television camera that will be mounted in the flight package so that it faces towards the earth. The camera will drive a low power amplitude modulated video transmitter operating on channel 35 in the UHF television band. The output from the transmitter will provide a usable ground signal for distances up to 500 Km away from the package.

The most exciting portions of the mission will be the take off and landing as the pictures will contain most detail at these times. When the package is flying the picture on the ground will show large objects such as dams, major roads, mountains, valleys and heavily populated areas. The intention is to use a lens that will give ground coverage of some 10 Kilometers across from the altitude that the package is expected to reach.

All that will be necessary to pick up signals is a normal black and white television set tuned to channel 35 and equipped with a suitable antenna. SA AMSAT recently petitioned the South African licensing Authority for permission to use TV channel 35 as it will encourage youth groups and young amateurs who do not have sophisticated equipment to participate.

[ANS thanks SA AMSAT for this bulletin]

/EX
SB ALL @ AMSAT $ANS-062.02
MICROSAT UPDATE (PART 1)

HR AMSAT NEWS SERVICE BULLETIN 062.02 FROM AMSAT HQ
SILVER SPRING, MD MARCH 3, 1990
TO ALL RADIO AMATEURS BT

MICROSAT Status Report

The work accomplished during week six of the AMSAT Satellite Factory (tm) brings closer the time when the satellites are fully commissioned for general use. Chris Williams (WA3PSD) of Weber State University reports that WO-18 Photo-04 is another keeper. It was taken over the north coast of the Bay of Bengal. It is mostly clouds, but the right side of the screen has them thinned out a bit and some faint detail of land can be decerned (with a trained eye).

AO-16's S band beacon is being activated. If a number of key telemetry parameters are within specified windows, the beacon will be left on for a period of time.

It has been determined that the power module version of the +10V bus for DO-17 is reading faulty. The AMSAT Engineering team is in the process of recalibrating it. Jim (WA4ONG) has been "manually" charging the batteries on DO-17 to top them off in anticipation of activation of the voice transmission

experiment on DOVE. Jim has managed to bring the TRUE battery voltage up almost 0.5 V in a short period of time. It is hoped that this next week will bring DO-17 closer to full commissioning.

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SB ALL @ AMSAT $ANS-062.03
MICROSAT UPDATE (PART 2)

HR AMSAT NEWS SERVICE BULLETIN 062.03 FROM AMSAT HQ
SILVER SPRING, MD MARCH 3, 1990
TO ALL RADIO AMATEURS BT

MICROSAT Status Report, PART 2

The AO-16 and LO-19 digipeaters have been turned on for use. Ralph Wallio, W0RPK, reports that he was able to connect to himself thru LO-19. While he was doing the normal things one does when first starting in Packet Radio such as sending yourself "Hello" and "Test" packets he received a *** Connect request from N4HY. Ralph quickly disconnected himself from himself (no comments please) and reconnected to N4HY.

On the LSTAT telemetry line now there is a new item which has the form of "d:n"; "d:0" means the digipeater is off, "d:1" means the digipeater is on. Telemetry normally comes down one each 10 seconds. When a packet is being digipeated, the time interval becomes 30 seconds. This is a compromise between those people who are using the digpeat function and those people who are looking simply to to copy the telemetry. The AMSAT Engineering Teams asks to please check the downlink BEFORE you transmit. If telemetry is coming down each 10 seconds, then look at the LSTAT line. If d=0, DON'T TRANSMIT. If you see other digipeat activity, then the digipeater is on, and it is OK to transmit. You must specify the spacecraft callsign as a digipeater to get digipeated, e.g., PACSAT-1. This is because there are multiple spacecraft on a specific frequency. N4HY advises that AO-16 and LO-19 will be unavailable at a moments notice and without warning at times as the AMSAT Engineering team is still uploading code.

Initial use of the AO-16/LO-19 digipeater has found that an AO-13 style 10-13dbi gain antenna and 10 watts are all that are needed to access a MICROSAT AT THE HORIZON. More power is not required. Deviation of your transmitter should be set to 3kHz. Also, if you can track your uplink with a program, track in the smallest units you can. Some radios can track through the serial link in much smaller intervals than can be commanded thru the front panel. Set your program to generate the data in small intervals as well. Success has been shown (using 6 seconds (.1 minute)) intervals with QuickTrak and Kansas City Tracker.

/EX
SB ALL @ AMSAT $ANS-062.04
IT SATELLITE DATA BASE ANOMALY

HR AMSAT NEWS SERVICE BULLETIN 062.04 FROM AMSAT HQ
SILVER SPRING, MD MARCH 3, 1990
TO ALL RADIO AMATEURS BT

INSTATRACK Satellite Data Base Anomaly

Users of InstantTrack who acquired element sets soon after the new birds were launched should check MICROSAT and UOSAT data carefully. Until this past weekend the object names for several of the birds were incorrect. This was the result of the mis-labeling that occurred at NORAD early on. Now that NORAD has corrected the labels, the element sets are correctly tagged with the proper satellite.

The mis-labling of our new satellites by NORAD has created a mixed identity

problem for InstantTrack users. For example, prior to the correction, object 20437 was identified as UO15. Well, in fact, 20437 is really UO14. However, if you have loaded recent element sets into IT you will get a satellite selection menu entry of UO15 actually loaded with UO14 elements. This problem will most likely occur with UO14/UO15/AO-16.

InstantTrack loads satellite elements by looking at the OBJECT NUMBERS and matching them to the object numbers in its database. It assumes that when you load the new elements for object 123, you want it to replace the data you presently have there for object 123. InstantTrack makes a second assumption. It assumes that when you load new elements for an object already in he database, you want to KEEP THE OLD NAME for the object. The reason for this is simple. The same object often goes by many different names. EGAP vs Ajisai. AO-13 vs Oscar-13. UO-11 vs UOSAT-2, etc.

The correct present relationship between object name and object number has been published several places recently. All you need to do is look at the name and object number for each MICROSAT. If they don't match the published relationship, then EDIT THE NAME ONLY. InstantTrack will already have loaded the correct orbital elements with the correct object number.

/EX
SB ALL @ AMSAT $ANS-062.05
AO-13/AO-10 TRANSPONDER SCHEDULE

HR AMSAT NEWS SERVICE BULLETIN 062.05 FROM AMSAT HQ
SILVER SPRING, MD MARCH 3, 1990
TO ALL RADIO AMATEURS BT

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         Mode-B  : MA 000 to MA 165
         Mode-JL : MA 165 to MA 195
         Mode-S  : MA 195 to MA 200
         Mode-BS : MA 200 to MA 205
         Mode-B  : MA 205 to MA 256
         Omnis   : MA 240 to MA 060

    BLON = 207.3  and  BLAT = 2.3   for 05Mar90
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The Mode-B beacon will be ON from MA 195 to MA 200. However from 21Feb90 to 21Mar90 there will be an OFF period from MA 20 to MA 90 due to solar eclipses affecting AO-13. The length of the eclipses vary from 12 to 89 minutes. Only the Mode-S transponder & the Mode-B beacon will be ON from MA 195 to MA 200.

AO-10 is currently experiencing solar eclipses during major portions of it orbit and until further notice its transponder is not available for use.

/EX
SB ALL @ AMSAT $ANS-062.06
UO-14 STATUS REPORT PART I

HR AMSAT NEWS SERVICE BULLETIN 062.06 FROM AMSAT HQ
SILVER SPRING, MD MARCH 3, 1990
TO ALL RADIO AMATEURS BT

UOSAT-OSCAR-14 Status Report #006 2-March-90, Part I

We apologize for the long delay between the last report and this one. The team at UoS has been very busy working toward the full commissioning of UO-14 and also trying all avenues toward the recovery of UO-15.

Firstly, happy birthday to UoSAT-OSCAR-11, now completing its 6th year in orbit! Congratulations to the international team which built this successful satellite.

UO-14 Attitude Control and Stabilization

UO-14 operations for the past month have concentrated on maneuvering the satellite into an attitude suitable for extension of the gravity gradient boom. On UO-9 and UO-11, these preliminary attitude control operations were conducted mostly under direct control of the Surrey Command Station, with only simple on-board computer programs. On UO-14, these operations are being conducted autonomously by the 1802 On Board Computer (OBC). This transfer from manual to automatic control has been made possible by extensive experimentation using UO-11, and development of complex autonomous attitude determination and control algorithms in the FORTH DIARY. These operations have been going well, if a bit slowly. University of Surrey's spacecraft attitude determination and control expert, Mr. Hodgart, has extensive lecturing and administrative commitments at the University, so software modifications and data analysis have sometimes been delayed.

In our last report, UO-14 was in a "flat spin", with the spin axis lying in the orbit plane, roughly north/south pointing. The first step was to slow this spin from 18 seconds to several minutes. Once the flat spin was slowed, controllers decided to impart some spin about the satellites Z axis. This is the normal spin motion for UoSAT satellites, and it distributes solar illumination evenly between all of the spacecraft's body mounted solar panels. This assures that no undesirable thermal gradients build up across the body of the satellite. Although control of Z axis spin is a regular part of UO-11 operations, it was found that spin control of a non-Earth-pointing UoSAT required some modifications to the OBC software. The desired Z spin rate was achieved during the last week in February.

After imparting spin about the Z-axis for proper thermal control, we wish to lock the Z axis to the Earth's magnetic field. Because of the alignment of the field, magnetic locking places the satellite in a favourable attitude for boom deployment as it makes descending passes over Guildford. Thus, once the satellite locked to the magnetic field, the boom will be deployed within range of the Command station, the magnetic lock software will be disabled, and the satellite should become gravity gradient stabilized. These operations are expected early next week (12 March).

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SB ALL @ AMSAT $ANS-062.07
UO-14 STATUS REPORT PART II

HR AMSAT NEWS SERVICE BULLETIN 062.07 FROM AMSAT HQ
SILVER SPRING, MD MARCH 3, 1990
TO ALL RADIO AMATEURS BT

UO-14 Status Report #006 2-March-90, Part II

Data Formats

UO-14 continues to run the FORTH DIARY on the 1802 OBC, using data formats distributed just after launch. The development, publication and implementation of downlink data formats for OSCARs is a delicate business, especially early in a mission. We do not want to publish data formats if they are likely to change quickly, lest people waste their time implementing software which will later become useless. On the other hand, if we do not publish formats, you cannot listen to the satellites - and that's what they're there for!

In the next month, we will be changing operating regimes on UO-14, as the PACSAT Communications Experiment (PCE) is brought on line. Once this happens, asynchronous data formats (as used by the DIARY) will give way to synchronous, AX.25 packet formats.

As soon as possible, the PCE on UO-14, and the BBS systems on AO-16 and LO-19 will be brought on line for general amateur store-and-forward communications access. All three of these satellites will be running the same software, using the same protocols - developed jointly by UoSAT and AMSAT-NA. NK6K and G0/K8KA have already published a draft standard for a broadcast (e.g. bulletins and Whole-Orbit-Data) protocol. A final specification should be distributed soon, and early transmissions from the UO-15 PCE will use this protocol. Specification of the message-transfer protocol is well under way.

Thus, the stable state, which we expect to reach sometime this spring, is that UO-14, AO-16 and LO-19 bulletin boards will be accessable with the same groundstation protocol software. Broadcasts from these satellites (e.g. bulletins and Whole-Orbit Data) will also come down in a single standard data format. Until we reach this state, ground station software developers are advised to make their programs modular and be ready to revise!

Downlink Modulation

UO-15 is capable of transmitting either 1200 baud AFSK (as used on all previous UoSATs and currently transmited by UO-14), or 9600 bits/second FSK. Ultimately, the PCE on UO-15 will support only 9600 bps FSK. During the transition from DIARY operations to PCE operations, however, we will also be transmitting AX.25 packets at 1200 bits/second AFSK. Like DOVE, this should be copyable with a standard, unmodified, TNC.

[AMSAT News Service would like to thank G0/K8KA for this bulletin.]

/EX
SB ALL @ AMSAT $ANS-062.08
UO-15 STATUS REPORT

HR AMSAT NEWS SERVICE BULLETIN 062.08 FROM AMSAT HQ
SILVER SPRING, MD MARCH 3, 1990
TO ALL RADIO AMATEURS BT

UO-15 Status Report #006 2-March-90

Experiments are under way using a large (150ft) antenna at Stanford Research Institute (SRI) to attempt to detect very low level signals leaking from the UO-15's on-board uplink receiver local oscillators. If the spacecraft power systems are still functioning, then these signals should always be present since the receivers cannot be switched off. However, these leakage signals are deliberately minimized during the design of the satellite and so they are very weak (-60 dBm = one thousand, millionth of a watt or the equivalent to looking for a single Xmas tree light in Australia!). The experiments at Stanford are therefore very demanding: it will only be possible to extract the signals from the background noise using sophisticated off-line digital signal processing, and a one second error in antenna tracking time may miss the satellite altogether!

Fortunately, we have UO-14 working well, and this sister satellite can be used as a "reference" to determine whether it is in fact possible to detect these signals even if UO-15 is alive (UO-14 & 15 use identical systems). After much processing, SRI successfully detected the leakage signal from UO-14 on Feb. 26th at the expected levels, and attempts to listen for UO-15 have just commenced. It may still take several weeks before the results are conclusive, since great care has to be taken to remove all sources of error and uncertainty. If the leakage signals are detected from UoSAT-15, then further tests are planned which should allow us to trace the nature of the fault.

[AMSAT News Service would like to thank G3YJO for this bulletin.]

/EX
SB ALL @ AMSAT $ANS-062.09

AMSAT HF NET SCHEDULES

HR AMSAT NEWS SERVICE BULLETIN 062.09 FROM AMSAT HQ
SILVER SPRING, MD MARCH 3, 1990
TO ALL RADIO AMATEURS BT

Numerous Regularly Scheduled AMSAT HF Nets Provide Timely Information

With events occuring so quickly in the world of amateur radio satellites, the quickest place to find information about operational news on the OSCARs is one of the many weekly HF AMSAT Nets. The following is a schedule of the many AMSAT Nets each week:

DAY	TIME	FREQUENCY	NCS	COMMENT
Sunday	09:00 UTC	14.280 MHz	ZS6AKV	AMSAT-SA Net
Sunday	10:00 UTC	3.685 MHz	VK5AGR	AMSAT Australia
Sundays	19:00 UTC	14.282 MHz	WD0HHU	AMSAT International Net
Sundays	19:00 UTC	21.280	W8GQW	Simulcasts On AO-13 when in View On 145.955 Mode B
Sundays	23:00 UTC	18.155 MHz	N4QQ	Excellent DX Windows
Tuesday	9:00 P.M. EST	3.840 MHz	W8GUS	AMSAT East Coast Net
Tuesday	9:00 P.M. CST	3.840 MHz	W0CY	AMSAT Mid America Net
Tuesday	9:00 P.M. PST	3.840 MHz	KI6QE	AMSAT West Coast Net
Saturday	15:00 UTC	28.460 MHz	WB2YGA	AMSAT Beginner's Net
Saturday	10:00 UTC	14.280 MHz	PA0DLO	AMSAT European Net
Saturday	22:00 UTC	14.282	ZL1WN	AMSAT South Pacific Net

/EX

Posted: Tue, Mar 6, 1990 4:33 AM GMT Msg: EGJA-4188-2261
From: JWHITE
To: is
CC: paclist
Subj: motion instalment 23b.24c.a1

TO: IS
CC: PACLIST

Further on motion...

Analysis of array currents has indicated that PACSAT-1 (AO-16) came out of its tumbling motion after separation spinning in the wrong direction. Because of the dynamics of the separation from the launch vehicle, there was a 50 - 50 chance of that happening with any of the microsats. Once it had locked into the magnetic field of the earth, about 10 days after launch, it began to slowly spin down from about a 10 minutes per revolution rate, to 30 minutes, to 1 hour, then on Feb 17th it essentially stopped all spinning motion for a couple of orbits, then began to turn in the opposite (correct) direction. As of March 3 it had spun back up to about 7 minutes per rev in the correct direction and will probably stabilize at that rate, which is the same speed at which LUSAT-1 (LO-10) is turning. A change in the telemetry gathering method will be necessary to determine if the wobbling motion, much like a top that is a bit out of balance, has been reduced from the 45 degrees measured in early February.

73 Jim White, WD0E